the St. Lawrence winding its way through a vast extent of level country, while in various parts extensive wooded islands were seen obstructing its course. On descending the south side of the mountain, which is closely wooded, the thermometer indicated 89° of Fahrenheit. The exertion caused by ascending and descending was severe; and owing to the parched state of the ground, and the flaccid vegetables with which it was covered, walking was rendered nearly as difficult as over sea-weeds on a rocky shore."

At this meeting the election of office-bearers for the ensuing year took place, when Dr. Douglas Maclagan was chosen President; and Professor Graham, Drs. Lowe, Greville and Seller, Vice-Presidents.

GEOLOGICAL SOCIETY.

Nov. 20, 1844.—A paper was read "On the Geology of Gibraltar." By J. Smith, Esq., of Jordan Hill.

The great rocky masses terminating Europe on the S.W. and Africa on the N.W., and cut through by the Straits of Gibraltar, consist of siliceous sandstones, associated with limestone, chert, shale and coal, all apparently of the oolitic formation. The Gibraltar limestone contains casts of *Terebratula fimbria* and *T. concinna*, species found in Britain in the lower oolite. The covering of the older rocks consists of soil, river alluvium, post-tertiary marine sands, and local patches of diluvium. Wherever the covering is removed, the surface of the rock beneath is seen to be water-worn. The rock of Gibraltar is 1470 feet high. The southern extremity is marked by a triple series of terraces and inland cliffs, formed by the sea at former levels. Its northern terminates in a perpendicular cliff. The elevated part is divided into three distinct eminences, the effects of different local upheavals. The northern of these (the rock gun) does not appear to have undergone any derangement in its stratification since its first upheaval, although it must have been subjected to many elevations and depressions of level. Its older beds (those of the limestone) dip west at an angle of 20°, and those formed since the elevation are horizontal, remaining in their natural position. In this state the whole of the rock must have remained for a lengthened period, until a second upheaval broke it across, leaving the northern portion in its original position, but lifting the whole of the southern 20° more, so that its beds, which formerly dipped 20° west, now dip 40°; and the fresh deposits, formerly horizontal, 20°. On these deposits, others, formed after the upheaval, rest unconformably. A third upheaval in the same direction, but still further to the south, lifted the rock there about 20° more, leaving the northern and middle hills in their former position, but inclining the southern 60°. Thus we have four distinct epochs; of the deposits formed during each we have remains, and at Martin's Cave the whole may be seen in juxtaposition. Immediately under O'Hara's tower, the highest peak, the inclination of the beds to the west is nearly 80°, and a short way to the south of it, they are vertical. Under this point there is, at the height of about

50 feet, sloping inwards 11°, beds of sandstone in a sea-worn cave, proving at least one other disturbance in addition. Subsequent to these great disturbing changes, there occurred a series of elevations and depressions, indicated by mixed beaches and sea-bottoms at different levels and by the surface of the rock perforated by Lithodomi and sea-worn to the very summit, indicating that the amount of change of level in these comparatively modern times—for the fossils in these deposits are in every case identical with species now living in the neighbouring seas—exceeded the height of the mountain, or 1470 feet. There are evidences, also, of a series of movements of depression. All these changes must have preceded the historical period, as previous to the last change, Gibraltar must have been an island, of which there is no record; the most ancient accounts describing it as it is now. The upheaving forces must have been deep-seated, as there are no erupted igneous rocks near.

MISCELLANEOUS.

SUBMARINE EXPLORATIONS BY M. MILNE EDWARDS.

M. Milne Edwards in a communication to the French Academy states, that having for some time been occupied in studying the lower marine animals, particularly Zoophytes, Mollusca, Vermes and Crustacea, in their living state, on the northern and eastern coasts of France, and being desirous of also entering upon a comparative study of species peculiar to warmer regions, he had visited with this view the shores of the Mediterranean, where their habitats not being rendered accessible as on the coasts of the Channel and the Atlantic by the alternations of the tide, he had availed himself of the apparatus invented by Colonel Paulin for a course of submarine exploration. He then describes the apparatus, which is a sort of helmet with glass eye-holes, and a flexible tube for a supply of air; and states, that by its aid, in Provence, Italy, Sicily and Algeria, he often explored the habitations of a multitude of these animals, remaining under water more than half an hour, and at a depth of more than seven mètres.

"Exploring by these means," he adds, "the rocks and the bottom of the port of Milazzo, I procured an immense number of the eggs of mollusks and annelides whose development I wished to study. Besides, I was enabled to catch in the irregularities of the bottom the minutest animals that remain fixed, and cannot be obtained in any other manner. I saw perfectly all that surrounded me, and it was muscular fatigue alone that hindered me from walking at the bottom of the sea just as I could do on the shore.

"The questions to which I had especially directed my attention relate to the embryology of the Annelida and of the Mollusca, to the circulation of the blood in the latter animals, as also in the Crustacea, and to the organization of the *Stephanomiæ*, and of the Ciliograde Acalephæ in general; but whilst following out these investigations I had occasion to make various observations on subjects of secondary